

ANNEX  
BETWEEN  
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AMES RESEARCH CENTER  
AND GENERAL ELECTRIC COMPANY  
UNDER SPACE ACT UMBRELLA AGREEMENT  
NO. 34470, SAA2-403615-1  
(ANNEX NUMBER ONE)

ARTICLE 1. PURPOSE

This Annex shall be for the purpose of collaboration between NASA and General Electric (GE) to address validation and verification of software for flight critical systems. Flight critical systems, e.g., flight management systems or guidance navigation-control systems, play a critical role in aviation since they are directly responsible to the safe operation of an aircraft. Therefore, it is essential that they are validated and verified rigorously.

This agreement will continue work in this domain begun under the Non-reimbursable Umbrella Space Act Agreement (SAA) between NASA and GE (SAA2-403098). The purpose of this follow-on agreement is to build on the accomplishments under that previous agreement and solidify the technology transfer for the NASA open-source software AdaStress (for adaptive stress testing) and AdvoCATE (for safety case creation and inspection).

The focus of this effort will be on the verification and validation of safety assurance for aviation systems, while including more emphasis on technology and its application to autonomous systems. This safety assurance research will broaden knowledge of operational risk assessment, evidence curation, and extend on adaptive stress testing, which are areas of mutual interest to both NASA and GE. This effort will supplement, but will not replace, GE's existing safety assurance validation efforts. GE remains solely responsible for safety assurance for its own aviation systems.

The legal authority for this Annex, consistent with the Umbrella Agreement, is in accordance with the National Aeronautics and Space Act (51 U.S.C. § 20113(e)).

ARTICLE 2. RESPONSIBILITIES

A. NASA ARC will use reasonable efforts to:

1. Provide information about open-source safety assurance technologies and tools developed under the NASA Airspace Operations and Safety Program (AOSP) program.
2. Provide expertise on how to utilize NASA open-source tools for validation and verification software for flight critical systems, in particular operational risk assessment, evidence curation and adaptive stress testing.

3. Extend NASA technologies for operational risk assessment, evidence curation and adaptive stress testing (AdvoCATE and AdaStress) to address industry needs identified by Partner.

4. Facilitate transfer and infusion of NASA open-source safety assurance technologies tools to Partner for use in Partner's advanced assurance demonstrative systems and prototypes.

5. If travel becomes necessary, proper COVID-19 safety protocols are to be followed. (No travel is scheduled at this time.)

B. Partner will use reasonable efforts to:

1. Assist NASA with understanding industry needs in assurance for aviation systems, including autonomous systems, in particular for operational risk assessment, evidence curation and adaptive stress testing.

2. Collaborate with NASA to facilitate transfer and infusion of NASA open-source tools to Partner for use in Partner's advanced assurance prototypes.

3. Review and provide feedback to NASA on the use of NASA advanced assurance tools on Partner's relevant demonstrative systems after transfer and infusion of NASA tools.

4. Partner will host NASA researchers at Partner site to support technology transfer, integration, and training on use of NASA open-source safety assurance technologies.

5. If travel becomes necessary, proper COVID-19 safety protocols are to be followed. (No travel is scheduled at this time.)

### ARTICLE 3. SCHEDULE AND MILESTONES

The planned major milestones for the activities for this Annex defined in the "Responsibilities" Article are as follows:

1. NASA and Partner will jointly organize and attend a planning meeting.	1 month after Effective Date
2. Partner will demonstrate progress in infusing NASA tools in their development and assurance processes and write a report on year 1 work.	12 months after Effective Date.
3. NASA and Partner will jointly organize and attend a mid-year 2 review.	18 months after Effective Date
4. Partner will demonstrate progress and write a report on year 2 work.	24 months after Effective Date

5. Partner will have a final demonstration and report on the effort of 36 months after infusing the NASA tools in their development and assurance processes. Effective Date

#### ARTICLE 4. FINANCIAL OBLIGATIONS

There will be no transfer of funds between the Parties under this Agreement and each Party will fund its own participation. All activities under or pursuant to this Agreement are subject to the availability of funds, and no provision of this Agreement shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, (31 U.S.C. § 1341).

#### ARTICLE 5. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

A. Data produced under this Annex which is subject to paragraph C. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement will be protected for the period of one year.

B. Under paragraph H. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement, Disclosing Party provides the following Data to Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data provided.

1. Background Data: The Disclosing Party's Background Data, if any, will be identified in a separate technical document.

2. Controlled Government Data: The Disclosing Party's Controlled Government Data, if any, will be identified in a separate technical document.

3. The following software and related Data will be provided to Partner under a separate Software Usage Agreement:

Potential software for the collaboration may include:

- AdaStress (Open Source)
- AdvoCATE (Open Source)

Because this software has been released under an Open Source license, a Software Usage Agreement is not required.

#### ARTICLE 6. TERM OF ANNEX

This Annex becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until the completion of all obligations of both Parties hereto, or three years from the Effective Date, whichever comes first, unless such term exceeds the duration of the Umbrella Agreement. The term of this Annex shall not exceed the term of the Umbrella Agreement. The Annex automatically expires upon the expiration of the Umbrella Agreement.

#### ARTICLE 7. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Annex by providing thirty (30) calendar days written notice to the other Party.

#### ARTICLE 8. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Annex.

##### Management Points of Contact

###### NASA Ames Research Center

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Deputy Project Manager, System-Wide Safety  
Moffett Field, CA 94035

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###### General Electric Company

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##### Technical Points of Contact

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#### ARTICLE 9. MODIFICATIONS

Any modification to this Annex shall be executed, in writing, and signed by an authorized representative of NASA and the Partner. Modification of an Annex does not modify the terms of the Umbrella Agreement.

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#### ARTICLE 10. SIGNATORY AUTHORITY

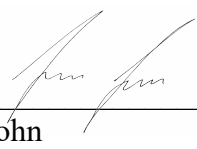
The signatories to this Annex covenant and warrant that they have authority to execute this

Annex. By signing below, the undersigned agrees to the above terms and conditions.

NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION  
AMES RESEARCH CENTER

GENERAL ELECTRIC COMPANY

BY: \_\_\_\_\_  
Dr. Huy K. Tran  
Director of Aeronautics

BY:  \_\_\_\_\_  
Justin John  
Technology Director, Controls and  
Optimization

DATE: \_\_\_\_\_

DATE: 5/14/21 \_\_\_\_\_